

WHAT IS CLAIMED IS:

1. An ink composition comprising (a) a styrene polymer or terpene polymer hardening component, (b) a nonpolymeric aromatic viscosity modifier, (c) a colorant, (d) an optional nonpolymeric aromatic ink vehicle, (e) an optional colorant dispersing agent, (f) an optional conductivity enhancing agent, (g) an optional antioxidant, and (h) an optional UV absorber.
2. An ink composition according to claim 1 wherein the ink has a melting point of no lower than about 60°C and no higher than about 140°C.
3. An ink composition according to claim 1 wherein the ink has a melt viscosity at jetting temperature of no higher than about 25 centipoise.
4. An ink composition according to claim 1 wherein the ink undergoes, upon heating, a change from a solid state to a liquid state in a period of no more than about 100 milliseconds.
5. An ink composition according to claim 1 wherein the ink exhibits an acoustic-loss value of no more than about 100 decibels per millimeter.
6. An ink composition according to claim 1 wherein the ink exhibits a conductivity of no less than about $6 \log(\text{picomho/cm})$.

7. An ink composition according to claim 1 wherein images generated with the ink exhibit a haze value of no more than about 25.

8. An ink composition according to claim 1 wherein the hardening component is poly (α -methyl styrene), poly (vinyl toluene-co- α -methyl styrene), poly (methyl styrene-co-indene) hydrogenated, poly (styrene-co-allyl alcohol), polylimonene, poly- β -pinene, poly(coumarone-co-indene), or mixtures thereof.

9. An ink composition according to claim 1 wherein the hardening component is present in the ink in an amount of no less than about 0.5 percent by weight of the ink and no more than about 28 percent by weight of the ink.

10. An ink composition according to claim 1 wherein the viscosity modifier is a biphenyl compound, a fluorene compound, a phenanthrene compound, a pyrene compound, an adamantane compound, a dibenzo compound, a diphenyl phosphino compound, a phenylsulfonyl compound, or mixtures thereof.

11. An ink composition according to claim 1 wherein the viscosity modifier is biphenylene, 4-acetylbiphenyl, 2-biphenyl carboxylic acid, 2,2'-biphenyldimethanol, 4,4'-dimethyl biphenyl, 2,2'-bis (bromomethyl)-1,1'-biphenyl, 4,4'-bis (dimethylamino) biphenyl carbinol, 4-bromo biphenyl, diphenylfulvene, diphenyl sulfone, 1,2-diphenoxy ethane, triphenyl methane, fluorene, 9-fluorene methanol, 9-fluorene acetic acid, 3-amino fluoranthene, 1-amino fluorene, 2-amino fluorene, 9-bromo-9-phenylfluorene, 1-methyl fluorene, methyl-9-fluorenylidene acetate, 4,4'-(9-fluorenylidene) bis(2-phenoxy ethanol), N-(9-fluorenyl methoxy carbonyl)-valinol, 9-fluorenone, phenanthrene, 9-iodophenanthrene, 9-acetylphenanthrene, 9-amino phenanthrene, 1-amino pyrene, 1-acetylpyrene, 1-bromopyrene, 1-(bromoacetyl) pyrene, 1,2,3,6,7,8-hexa hydropyrene, 1-pyrenemethanol, 1-pyrenebutanol, 1-adamantane methanol, 1-adamantane ethanol, 1-bromo adamantane, 2-bromo adamantane, 1-iodo adamantane, 2-(1-adamantyl)-4-methyl phenol, 1-bromo-3-(bromomethyl) adamantane, 1-bromo-3,5-dimethyl adamantane, 3-(bromomethyl)-2,4,10-trioxa adamantane, 1,3-dibromoadamantane, 1,4-dibromoadamantane, dimethyl-1,3-adamantane dicarboxylate, 1-azido adamantane, 3-noradamantane carboxylic acid, 1-adamantyl bromomethyl ketone, dibenzo-24-crown-8, dibenzo-30-crown-10, dibenzofuran, dibenzosuberane, dibenzosuberanol, dibenzosuberol, dibenzosuberone, dibenzothiophene, diphenylfulvene, 1,3-diphenyl isobenzofuran, bis(diphenylphosphino) methane, 1,2-bis(diphenylphosphino) ethane, 1,2-bis(diphenylphosphino) ethylene, 1,4-bis(diphenylphosphino) butane, 2,3-bis(diphenylphosphino) butane, 1,6-bis(diphenyl phosphino) hexane, 1,1,1-tris(diphenyl phosphino methyl) ethane, 1,4-bis(dicyclohexyl phosphino) butane, 1,2-bis(phenylsulfonyl) ethylene, bis(phenylsulfonyl)

methane, 1-bromomethyl-2-((phenylsulfonyl) methyl) benzene, 2-(phenylsulfonyl)tetrahydropyran, or mixtures thereof.

12. An ink composition according to claim 1 wherein the viscosity modifier is present in the ink in an amount of no less than about 0.5 percent by weight of the ink and no more than about 45 percent by weight of the ink.

13. An ink composition according to claim 1 wherein the colorant is a dye.

14. An ink composition according to claim 1 containing an ink vehicle in an amount of no less than about 0.5 percent by weight of the ink and no more than about 70 percent by weight of the ink.

15. An ink composition according to claim 1 containing an ink vehicle which is 4-hexyl resorcinol, 4-dodecyl resorcinol, 4-(tert-octyl) phenol, 4-bromo-N-dodecyl-1-hydroxy-2-naphthalene carboxamide, 2,2-diphenyl-1,4-diazaspiro-(4,5)deca-1,3-diene, N,N'-dibenzyl-1,4,10,13-tetraoxa-7,16-diazacyclooctadecane, 1,4-dihydro-9-isopropylidene-1,4-methanonaphthalene, 1,4,4a,8a-tetrahydro-endo-1,4-methanonaphthalene, 1,5-dihydroxy-1,2,3,4-tetrahydronaphthalene, 2,5-difluorophenylhydrazine, or mixtures thereof.

16. An ink composition according to claim 1 containing a colorant dispersing agent in an amount of no less than about 1 percent by weight of the ink and no more than about 50 percent by weight of the ink.

17. An ink composition according to claim 1 containing a colorant dispersing agent which is 2-hydroxyisocaproic acid, 2-hydroxy isobutyric acid, benzylmalonic acid, dibenzoyltartaric acid, methylsuccinic acid, 2-ethyl-2-methylsuccinic acid, 2,2-dimethyl glutaric acid, 3,3-dimethylglutaric acid, 1-hydroxy-1-cyclopropane carboxylic acid, 2,2,3,3-tetramethyl cyclopropane carboxylic acid, 1-benzo cyclobutane carboxylic acid, 3-oxo-1-indan carboxylic acid, 2-oxo-6-pentyl-2H-pyran-3-carboxylic acid, diphenyl carbonate, 1,2-diphenylvinylene carbonate, 2-oxazolidone, flavone, 4-methoxy chalcone, 4'-methoxy chalcone, γ -(2-naphthyl)- γ -butyrolactone, diphenyl- γ -butyrolactone, 2,6-dimethyl-4H-pyran-4-one, distyryl ketone, 4-(4-hydroxyphenyl)-2-butanone, 1,3-diacetyl-2-imidazolidinone, 2,6-diphenyl cyclohexanone, flavanone, 1-(2-hydroxyphenyl)-3-phenyl-1,3-propanedione, 1-(2-hydroxy-5-methylphenyl)-3-phenyl-1,3-propanedione, tetramethyl-1,3-cyclobutanedione, 2,5-oxazolidinedione, 5,5-dimethyloxazolidine-2,4-dione, 3,6-dimethyl-1,4-dioxane-2,5-dione, 2,2-dimethyl-1,3-dioxane-4,6-dione, 4,4-dimethyl-1,3-cyclohexanedione, benzylphenyl ketone, di-n-benzyl ketone, diphenyl acetone, poly (vinyl phenyl ketone), poly (vinyl phenyl ketone) hydrogenated, polycyclohexanone, poly(coumarone-co-indene), polycaprolactone, poly(ethylene-co-carbon monoxide), poly(1-vinylpyrrolidone)-graft-(1-triacontene), 3-hydroxybenzaldehyde, 4-hydroxybenzaldehyde, 4-benzyloxybenzaldehyde, 2-carboxybenzaldehyde, 4-nitrobenzaldehyde, 2,3-dihydroxybenzaldehyde, 2,5-dihydroxybenzaldehyde, 3-hydroxy-4-methoxybenzaldehyde, 4-hydroxy-3-methoxybenzaldehyde, 4-hydroxy-3-ethoxybenzaldehyde, 4-hydroxy-3-methylbenzaldehyde, 2-hydroxy-5-nitrobenzaldehyde, 3-hydroxy-4-nitrobenzaldehyde, 4-hydroxy-3-nitrobenzaldehyde, 3,4-

dibenzoyloxy benzaldehyde, 3,5-dibenzoyloxybenzaldehyde, 4-acetoxy-3,5-dimethoxybenzaldehyde, 2-amino-3,5-dibromobenzaldehyde, 2-benzoyloxy-4,5-dimethoxybenzaldehyde, 5-bromo-2-hydroxy-3-methoxybenzaldehyde, 4-hydroxy-3,5-dimethoxybenzaldehyde, 2,3,5-trichlorobenzaldehyde, 2,3,6-trichlorobenzaldehyde, 2,4,5-trimethoxybenzaldehyde, 2,4,6-trimethoxybenzaldehyde, 3,5-dichloro-2-hydroxybenzaldehyde, 3,5-dibromo-2-hydroxybenzaldehyde, 3,5-diiodo-2-hydroxybenzaldehyde, 3,4-dihydroxy-5-methoxybenzaldehyde, 3,5-dimethyl-4-hydroxybenzaldehyde, 2,6-dimethoxybenzaldehyde, trans-2-nitro cinnamaldehyde, trans-4-(diethylamino) cinnamaldehyde, 4-acetoxy-3-methoxy cinnamaldehyde, 4-hydroxy-3-methoxy cinnamaldehyde, 2-hydroxy-1-naphthaldehyde, 2-methoxy-1-naphthaldehyde, 9-anthraldehyde, 5-bromo-2-furaldehyde, 5-nitro-2-thiophene carboxaldehyde, 9-ethyl-3-carbazole carboxaldehyde, 4-stillbenecarboxaldehyde, 2-hydroxy-5-methyl-1,3-benzene dicarboxaldehyde, terephthal dicarboxaldehyde, 2-(diphenylphosphino) benzaldehyde, 1-(phenylsulfonyl)-2-pyrrolicarboxaldehyde, 1-pyrene carboxaldehyde, phenanthrene carboxaldehyde, 2-fluorene carboxaldehyde, poly ((phenyl glycidyl ether)-co-formaldehyde), poly ((o-cresyl glycidyl ether)-co-formaldehyde), poly (p-toluenesulfonamide-co-formaldehyde), or mixtures thereof.

18. A printing process which comprises incorporating an ink according to claim 1 into an ink jet printing apparatus, melting the ink, and causing droplets of the melted ink to be ejected in an imagewise pattern onto a recording sheet.

19. A process according to claim 18 wherein the printing apparatus employs an acoustic ink jet process, wherein droplets of the ink are caused to be ejected in imagewise pattern by acoustic beams.

20. A process according to claim 18 wherein the printing apparatus employs an acoustic ink jet printing process wherein droplets of the ink are formed by acoustic beams without imparting a substantial velocity component toward the print medium, using a droplet forming force that is sufficient only to form the ink droplets, and wherein the printing process further comprises generating an electric field to exert an electrical force different from the droplet forming force on the ink droplets to move the ink droplets toward the print medium, and controlling the electrical force exerted on the formed complete ink droplets by the electric field.

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